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Date of Deposit: 10-10-2006 By: Debbie Lindquist

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Appellant: GLOVER, JOHN N.	§	Art Unit: 1723
Filed: May 27, 1999	§	Primary Examiner: David L. Sorkin
Application No.: 09/320,950	§	Docket No.: 20781.004
For: FILTERING MEDIUM AND METHOD FOR CONTACTING SOLIDS CONTAINING FEEDS FOR CHEMICAL REACTORS	§	

TRANSMITTAL LETTER

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Transmitted herewith for filing are the following documents:

1. Reply Brief (in triplicate);
2. Certificate of Mailing Under 37 CFR 1.8; and
3. Our return postcard, which we would appreciate your date stamping and returning to us upon receipt.

The Director is authorized to charge or credit any fees to Bracewell & Giuliani LLP, Deposit Account No. 50-0259 (Order No. 20781.004).

Respectfully submitted,

Dated: October 10, 2006

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CERTIFICATE OF MAILING

I hereby certify that this paper is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date of Deposit: 10-10-2006 By: Jeanne Lindquist

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
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In re Appellant: GLOVER, JOHN N.	§	Art Unit: 1723
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REPLY BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Primary Examiner's Answer dated August 9, 2006, Applicant hereby submits this Reply Brief to clarify a few select points raised by the Primary Examiner in Section (10) on pages 7-8 of the Primary Examiner's Answer titled "Response to Argument" (See Exhibit A - "Response").

Ellipses

In the second paragraph of the Response, page 7, the Primary Examiner states that "the broadest reasonable definition of 'ellipse' includes circles." (See Exhibit A). On this basis, the Primary Examiner rejected Applicant's assertion that "ellipses" are distinguishable from the circles of the prior art. *Id.*

Notably, however, in the very first Office Action for this application dated April 26, 2000, on page four, the Primary Examiner stated that "circles are not elliptical," and on that basis found Applicant's claim reciting "an elliptical cross section selected from the group consisting of ellipses and circles" to be indefinite. (See Exhibit B). These two statements from the same Primary Examiner during the prosecution of the same application, *i.e.*, "the broadest reasonable definition of ellipse includes circles" and "circles are not elliptical," appear to be directly conflicting with each other.

The Primary Examiner, as one of ordinary, if not extraordinary, skill in the art, first determined that circles and ellipses are distinguishable as a basis for objecting to Applicant's initial claims. The Primary Examiner then changes his position and takes the directly opposing view that circles and ellipses somehow are not distinguishable to support a rejection of Applicant's subsequent claims. On the basis of this strained construction, the Primary Examiner also dismisses Applicant's experimental test results as being "of no consequence," and does not give them full weight and consideration. (see Exhibit A, page 7, third paragraph).

There is evidence throughout the prosecution history to indicate that Applicant distinguishes between elliptical-shaped and circular-shaped openings, and that circular openings

are not an embodiment of Applicant's claimed invention. For example, Applicant noted on page 12 in its Office Action Response dated February 17, 2005, that utilizing ellipses instead of circles as the shapes of the openings in the ceramic units allows for alteration of the size of the minor and major axes to allow for better control of the lateral fluid distribution emitted from the opening. (See Exhibit C, page 12). Applicant's test results submitted to the Primary Examiner with the Declaration of the inventor John Glover during prosecution support these findings. (See Exhibit D). Also, the drawings in the application (see Exhibit E, FIGS. 4 - 13) show a clear and noticeable difference in the dimensions of the circular openings and elliptical openings in the ceramic units. The dimensional differences between circular and elliptical openings are also clearly visible in the physical samples of ceramic units that were submitted to the Primary Examiner with the Declaration of the inventor. Further, language in the specification (see Exhibit E, ¶[0012]) expressly sets forth that the dimensional measurements for a cross-sectional configuration of a circle and major and minor axis configurations of an ellipse are different.

Further, the Primary Examiner acknowledges that the primary reference ("Kramer") does not disclose a unit having three elliptical openings (See Exhibit A, page 7, second paragraph), which further supports the nature of Applicant's claimed filtering medium.

Inherency

In the first paragraph of page 7 of the Response, the Primary Examiner states "that fluid is distributed upon being fed through a bed of particles is *inherent*." (emphasis supplied). This statement was made in Response to Applicant's two paragraphs of submitted arguments against

such inherency in its Appeal Brief (see Exhibit F , Appeal Brief, last paragraph of page 7 and first paragraph of page 8).

The Primary Examiner did not provide any additional argument or supporting evidence in the Response to support the existence of the alleged inherency of the fluid distribution claim limitation, other than a statement that the teachings of the prior art Kramer reference are "identical" to the present invention with regard to fluid distribution. (see Exhibit A, page 7, first paragraph).

With all due respect to the opinion of the Primary Examiner, Applicant submits that the specification of Kramer does not teach, disclose, mention, suggest or allude to fluid distribution in any manner, nor is the claimed fluid distribution inherent in Kramer. In contrast, the specification of the present application expressly discloses both fluid distribution and filtering, and can therefore support different sets of claims directed to fluid distribution and filtering.

The Primary Examiner's reasoning regarding the alleged inherency subject matter is not well taken. The Primary Examiner seems to be arguing that Kramer must somehow relate to fluid distribution, simply because the present application makes reference to fluid distribution. To use, however, the claims and teachings of Applicant's present invention to insert unsupported but allegedly "inherent" subject matter into the prior art is akin to a hindsight reconstruction of the prior art by the Primary Examiner, which is not permitted.

Applicant respectfully submits that the Primary Examiner's unsupported allegation that a feature is "inherent" in Applicant's claims when the feature is not taught, disclosed, mentioned,

suggested or alluded to in the cited references is insufficient to overcome or disprove Applicant's arguments regarding non-inherency.

Test Results

As to the Primary Examiner's statement in the Response, fourth paragraph, pages 7-8 that Applicant's experiments did not include a test of a six-hole device taught in Fulton, Applicant respectfully submits that, as stated in its previous Office Action Response dated February 17, 2005, (see Exhibit C, pages 10-11), testing of a six-hole device was impractical, if not impossible, as this embodiment was not, to Applicant's knowledge, commercially available at the time. Requiring Applicant to supply and test such a device would place an undue burden on Applicant. Perhaps the device was not available because it was not commercially successful, which if true, would support Applicant's previous arguments relating to the commercial success and surprising and unexpected results provided by Applicant's products. The 4-hole device which was tested by Applicant is believed to be the commercially available embodiment that is most similar to the Fulton device.

Conclusion

For the above reasons, it is respectfully submitted that the Examiner's rejections should be overturned.

No fees are believed to be due at this time. If fees are due, please charge any such fees and credit any overpayments to the Deposit Account of Bracewell & Giuliani LLP, Deposit Account No. 50-0259 (attorney docket no. 020781.04).

Respectfully submitted,

Date: 10/19/06

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(10) Response to Argument

Appellant argues beginning on page 7 of the brief that Kramer does not disclose a method of *fluid distribution*, but rather a method of *filtering*. However, Kramer discloses feeding fluid to a bed of particles. That fluid is distributed upon being feed through a bed of particles is inherent. It is also noted that the instant application, in the first sentence of the background of the invention, states "The invention relates to a filtering medium and method for filtering"; therefore, that the fluid distribution method of Kramer involves filtering makes it identical to the instant application in this respect.

Each of the instant independent claims requires three elliptical openings. It is agreed that Kramer does not disclose a unit have three elliptical openings. However, contrary to appellant's arguments on page 9 of the brief, Fulton discloses a unit having a central opening and four surrounding elliptical openings, as seen in Fig. 1, particularly the unit in column three, row five of Fig. 1. The instant claims are open to the elliptical openings being any type of elliptical opening, including circular openings. The broadest reasonable definition of "ellipse" includes circles. Just as squares are a specific subset of rectangles, circles are a specific subset of ellipses.

Appellant's discussion of supposed improved results concerning circle-shaped openings versus other types of ellipses are of no consequence, because the claims are open to all types of ellipses including circles.

Similarly, concerning the declaration of Mr. Glover, the prior art product C is within the scope of the claims. The 6 circular openings surrounding a central opening, are consistent with the claim requirement of at least 3 elliptical openings and a central

opening, because circles are a specific subset of ellipses. Also, the experiments of Mr. Glover, compare four "elliptical" surrounding openings to six (rather than four) circular openings, even though Fulton discloses four surrounding circular/elliptical openings. Also, Mr. Glover does not explain to what degree, if any, the elliptical openings of products F-H differ from circles.

Regarding the motivation to combine the teachings of the references, it would have been obvious to one of ordinary skill in the art to have shaped the units of Kramer according to the teachings of Fulton, because Kramer explains that alternative unit shapes may be used in the disclosed processes (see Table 2 and col. 4, lines 1-4). Furthermore, Fulton teaches the relied upon shape as an alternative to other shapes including spheres (see page 97) and explains that passages in the units can significantly reduce the amount of material needed, while minimizing lose of strength (see pages 97 and 98, Fig. 3).

Appellant begins to address the section 112, first paragraph rejection on page 13 of the brief. Claim 59, from which claims 82 and 83 depend, require "a substantially annular outer peripheral shape". Appellant's statement "the triangular, quadrilateral, pentagonal and other similarly shaped figures shown in the aforementioned drawings all, by definition, have three or more sharp corners and/or edges formed one their outer peripheries" is irrelevant to the required "annular outer peripheral shape". Furthermore, appellant fails to distinguish between an "edge" and a "shape edge". It is the word "sharp" that introduces new matter.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

David L. Sorkin
Primary Examiner
Art Unit 1723

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UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
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Washington, D.C. 20231

A-S

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/320,950	05/27/99	GLOVER	J 2797.004

EXAMINER	
SORKIN, D	
ART UNIT	PAPER NUMBER
1723	4

IM62/0426

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HOUSTON TX 77056-3023

DATE MAILED: 04/26/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

11. Claim 5: An elliptical cross-section selected from the group consisting of ellipses and circles is claimed. Since circles are not elliptical, the claim is indefinite, as it is unclear whether circles are within the scope of the claim.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1-3, 6, 8-9, and 14-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Hung (DE 35 39 195).

14. Claim 1: Hung ('195) discloses a filtering medium comprising a plurality of ceramic units at least some of which have a plurality of openings and at least some of the openings are ellipses (see fig. 3 and the Derwent abstract).

15. Claim 2: The units of Hung ('195), discussed above with regard to claim 1, have a thickness of about 0.125 to 1.5 inches (Derwent abstract; note 1 in. = 25.4 mm).

16. Claim 3: The units of Hung ('195), discussed above with regard to claim 1, have closed plane shaped cross-section configuration, each having a width of about 0.25 in. to 3 in. at the widest point (see fig. 1-3; Derwent abstract).

17. Claim 6: The units of Hung ('195), discussed above with regard to claim 1, have a fluted surface (see fig. 3).

Shapes of the Units

Although Kramer does explain that alternative shaped units can be used (col. 4, lines 1 – 4), with spheres being the preferred shape, there is no suggestion that a ceramic filter unit with openings, specifically three or more passages surrounding a central passage, can be used. Applicant's claims 59, 67, and 78 require that the surrounding openings have an elliptical shape. Kramer repeatedly indicated that a sphere was the unit of choice. Every example given in Kramer illustrated the use of a sphere without any openings. More specifically, Examples 1, 2, and 3 in Kramer exclusively uses spheres as the filtering medium.

An important aspect of an embodiment of the present invention is to uniformly distribute the organic-based feed stream across a catalyst bed to prevent channeling and other deleterious consequences by passing the stream through openings in the units. The spherical units disclosed within Kramer would not provide the required flow through at least some of the units.

Declaration of Inventor

Applicant's use of the ceramic units of the present invention unexpectedly results in advantageous fluid distribution properties, such as improved horizontal fluid distribution and significantly decreased pressure drop across a filter bed. To support these assertions, Applicant has submitted the attached declaration of John N. Glover (hereinafter referred to as the "Declaration"). Mr. Glover has substantial experience in the ceramic and catalyst industries and has participated in experiments resulting in unexpected and surprising, advantageous fluid distribution properties. The Declaration also provides evidence of the commercial success of these ceramic units, which is indicative of the fact that the claimed ceramic filter units of the present invention should be deemed to have met a long felt, unfilled need in the petroleum refining and petrochemical industries. Applicant has performed experiments comparing the ceramic filter units of the present invention with prior art ceramic units that are structurally similar to ceramic units, such as those found in Fulton and Kramer.

It should be noted that according to the Applicant, to the best of his knowledge, the Fulton Ceramic Unit was not commercially available at the time of the experiments and thus

could not be tested. (see page 2, ¶ 7). A similar commercially available unit ("Product C") was instead utilized. *Id.*

Several measurements were taken during the experiments to help determine the amount of lateral fluid distribution that was achieved using several different ceramic units. Table I summarizes the results of each experiment. The best results are indicated by boxed numbers. Five prior art ceramic units (Products A, B, C, D, and E) were compared to three ceramic units made in accordance with the present invention (Products F, G, and H). The prior art ceramic unit results are shaded in gray in Table I and the results for the ceramic units made in accordance with the present invention are non-shaded and located on the right side of Table I. Descriptions of the Products tested can be found in Paragraphs 5 – 10 of the Declaration and in Table I in row labeled as "Product". Samples of the two best performing prior art ceramic units, Products C and E, were included in Applicant's response dated November 5, 2003. Samples of the two best performing ceramic units made in accordance with the present invention, Products F and H, were also included in Applicant's above indicated response.

A detailed description of the experiments that were performed and the apparatus is included in the Declaration in paragraphs 11 – 23. The ceramic units of the present invention performed significantly better than the prior art units similar to those shown in Fulton and Kramer. The experiments showed that there was a substantial increase in the lateral distribution using the ceramic units of the present invention as opposed to the ceramic units with the shapes similar to those shown in Fulton and Kramer.

As described in paragraphs 24 – 25 of the Declaration appended hereto, the ceramic units made in accordance with the present invention performed significantly better than the prior art ceramic units consistently through each experiment that was performed. The experiments illustrate the unexpected results obtained by using the present invention as opposed to the prior art ceramic units. The ceramic units made in the accordance with the present invention provided more lateral distribution for fluid than the prior art ceramic units did.

Claims 59, 66 – 67, and 77 – 78 recite the use of elliptical openings. Support in the specification for the amendments can be found in FIGS. 4, 5, and 12 of the specification. Neither

of the references taken alone or in combination with each other describe a ceramic unit with a central opening and three or more elliptical openings.

Use of elliptical openings also provides an additional design parameter to specify when designing the ceramic units to maximize the amount of material that is allowed to pass through the body of the ceramic unit. For instance, when a circular shape is used for the surrounding openings, as in the Fulton Ceramic Unit, the design parameters that can be changed include the unit diameter, the unit length, the central opening diameter, the number of outer openings, the location of the center of the outer openings, and the diameters of the outer openings. If elliptical outer openings are used, the design parameters that can be changed include the unit diameter, the unit length, the central opening diameter, the number of outer openings, the location of the center of the outer openings, the major axis of the elliptical openings, and the minor axis of the elliptical openings. Using elliptical openings, along with the central opening, provides better control of the amount of fluid distribution and filtering provided by the ceramic units. This allows manufacturers to better customize the ceramics for each application. If more lateral distribution is required in a particular application, then the manufacturers have an additional parameter to optimize to improve lateral distribution.

In addition to the unexpected results obtained by the ceramic units of the present invention, the Assignee of Applicant has enjoyed substantial commercial success from the sale of the ceramic units of the present invention, as described in Paragraph 26 of the appended Declaration. In the period from 1998 to the execution of the Declaration in 2003, Applicant's Assignee sold more than eight million dollars worth of ceramic units, which correlates to approximately 40,000 cubic feet of unit sold. At the time, the ceramic units of the present invention were the number two selling ceramic units with approximately 30% - 35% of the market. The commercial success of the ceramic units made in accordance with the present invention should be considered indicative of the fact that the ceramic units have met a long felt, unfilled need in the ceramic filter industry.

As indicated previously, neither Kramer nor the combination of Kramer and Fulton disclose the present invention. The Federal Circuit noted in *In re Fritch* that:

> Under Section 103, teachings of references can be combined only if there is some suggestion or incentive to do so. Although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious "modification" of the prior art. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. 23 U.S.P.Q. 2d 1780, 1784 (Fed. Cir. 1992).

Neither Kramer nor any of the other prior art cited suggest the desirability of combining Kramer with Fulton to accomplish Applicant's invention. Even if these references were combined, they would not disclose each element of claims 59, 67, or 78.

Applicant respectfully submits that neither Kramer nor the combination of Kramer and Fulton teaches each required element of claims 59, 67, and 78. There is no suggestion to combine the references, and even if there were, the combination does not disclose the present invention. Applicant respectfully submits that the basis for the 35 U.S.C. § 103(a) rejections has been removed.

As the independent claims are directed to novel subject matter, dependent claims are by definition also direct to novel subject matter and include all of the distinct elements of the independent claims. Applicant submits that claims 59, 67, and 78 are patentably distinguishable from Kramer in view of Fulton, thereby removing any basis for the 35 U.S.C. § 103(a) rejection.

35 U.S.C. §103(a) Rejection – Kramer in view of Fulton and Hung

Claims 59, 61-67 and 69-81 were rejected under the provisions of 35 U.S.C. § 103(a), as allegedly being unpatentable over Kramer in view of Fulton, and further in view of Hung et al. (DE 3,539,195).

Applicant submits that neither Kramer alone or in combination with Fulton, if such combination was deemed proper, teach all of the features of the present claims. By combining Kramer with Fulton and Hung, if such combination was deemed proper, the combination of the three references would still not disclose the present invention. Hung, which has a catalyst with openings that can be elliptical or circular, does not disclose the use of a central opening, as described herein. Thus, neither Kramer, nor the combination of Kramer with Fulton or Kramer with Fulton and Hung disclose each feature of the present invention. As such, the references,

alone or in combination, do not disclose the present invention, which makes the present invention patentably distinguishable from the ceramic units of the cited references.

SUMMARY

Kramer is missing at least one element of the present invention. No motivation exists to combine Kramer with Fulton or Kramer with Fulton and Hung. Even if the combination of the references were deemed proper, the combination does not disclose each element of the present invention.

In commenting upon the references and in order to facilitate a better understanding of the differences that are expressed in the claims, certain details of distinction between the references and the present invention have been mentioned, even though such differences do not appear in all of the claims. It is not intended by mentioning any such unclaimed distinctions to create any implied limitations in the claims. Not all of the distinctions between the prior art and Applicant's present invention have been made by Applicant. For the foregoing reasons, Applicant reserves the right to submit additional evidence showing the distinctions between Applicant's invention to be novel and nonobvious in view of the prior art.

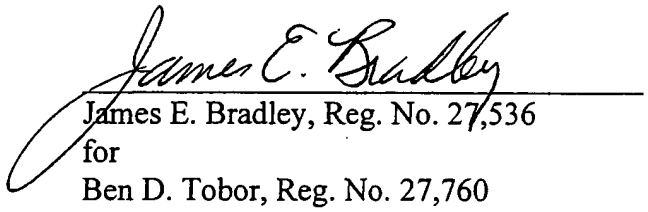
The foregoing remarks are intended to assist the Examiner in examining the application and in the course of explanation may employ shortened or more specific or variant descriptions of some of the claim language. Such descriptions are not intended to limit the scope of the claims; the actual claim language should be considered in each case. Furthermore, the remarks are not to be considered to be exhaustive of the facets of the invention that render it patentable, being only examples of certain advantageous features and differences which Applicant's attorney chooses to mention at this time.

In view of the foregoing Amendment, Applicant respectfully submits that the presently presented claims are allowable, and Applicant respectfully requests the issuance of a Notice of Allowance.

The Commissioner is hereby authorized to charge all fees and any additional fees that may be required or credit any overpayment to Bracewell & Patterson, L.L.P. Deposit Account No. 50-0259 (Order No. 020781.004).

Respectfully submitted,

Date: February 17, 2005



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:	§	
	§	
GLOVER, JOHN N.	§	
	§	
Filed: May 27, 1999	§	Art Unit: 1723
	§	
Application No.: 09/320,950	§	Examiner: David L. Sorkin
	§	
For: FILTERING MEDIUM AND METHOD FOR CONTACTING SOLIDS CONTAINING FEEDS FOR CHEMICAL REACTORS	§	Docket No.: 20781.004

DECLARATION OF JOHN N. GLOVER

I, John N. Glover, declare that I am over the age of twenty-one (21) years of age and am fully competent to make this declaration. I have personal knowledge of the facts set forth in this declaration and they are true and correct. I declare:

1. I am the President of Crystaphase International, Inc. and its related corporate entities (hereinafter "Crystaphase"), and maintain an office at Crystaphase at 16825 Northchase Drive, Suite 660, Houston, TX. 77060-6029. I have been employed by Crystaphase since 1989 to the present as the President. I am the name inventor in the above-identified patent application and am familiar with the disclosure in the above-identified patent application.

2. I have worked in the petroleum refining and petrochemical industries for at least twenty-four years. I am familiar with ceramic filter units, catalysts, and recycling of these units.

3. I am a named inventor of the subject application and thus would be considered of above-ordinary skill in the art of ceramic filter units and associated methods. In my position of President, I have supervised numerous individuals and therefore am knowledgeable about the level of understanding of one with ordinary skill in the art in the field of ceramic filter units.

4. My educational experience includes undergraduate studies in Biology and Chemistry. I have performed numerous experiments on the subject matter of the above referenced patent application. I am extremely familiar with terms in the industry and the understanding associated with those terms throughout the industry.

5. I participated in an experiment in which comparative performance data was obtained for ceramic filter units comparing ceramic units in accordance with the present invention having combinations of elliptical and circular openings, along with flutes, to ceramic units in accordance with prior art units having combinations of circular openings and flutes. Five prior art ceramic units (Products A, B, C, D, and E) were compared to three ceramic units made in accordance with the present invention (Products F, G, and H, as shown in FIG. 4 of the present application).

6. Products A and B were spherical ceramic balls made in accordance with the ceramic units in U.S. Patent No. 4,615,796 issued to Kramer (hereinafter "Kramer"), with Product A having a 6" bed and Product B having a 12" bed.

7. Product C was a 5/8" disc with six circular openings and one central circular opening that is substantially similar to the closest prior art in "CE Refresher: Catalyst Engineering, Part 2" by John Fulton (hereinafter "Fulton") as shown at Fig. 1, third column, fifth row (hereinafter "Fulton Ceramic Unit"). A sample of Product C has been included and is labeled as C. Product C is manufactured by Haldor Topsoe A/S and is commercially available as TK-10. TK-10 has been on the market for approximately seventeen years and is the number one selling ceramic unit. Product C (i.e., TK-10) is the closest commercially available ceramic unit structurally to the Fulton Ceramic Unit. Product D is a 7/8" disc with six circular openings and one central circular opening. Product D is substantially similar to Product C, but with a larger diameter. To the best of my knowledge, the Fulton Ceramic Unit is not commercially available.

8. Product E is a 5/8" ceramic unit with one central circular opening and six flutes. Product E is commercially available as Dypor 607 and is manufactured by Dytech Corporation, Ltd. in Sheffield, England. A sample of Product E has been included and is labeled as E.

9. Product F is a 5/8" ceramic unit with one central circular opening and four surrounding elliptical openings made in accordance with the present invention. A sample of Product F has been included and is labeled as F. Product G is a 7/8" disc with one central circular opening and four surrounding elliptical openings, also made in accordance with the present

invention. Products F and G are commercially available as BG-1000 and are sold by the Assignee of the present invention.

10. Product H is a 7/8" elongated disc with one central circular opening and four surrounding elliptical openings made in accordance with the present invention. Product H is commercially available as BG-1002 and is sold by the Assignee of the present invention. A sample of Product H has been included and is labeled as H. Product H is twice as long as Product G.

11. A test apparatus was constructed using a 12" internal diameter by 18" tall 26 gauge steel cylinder with a collection grid inside the cylinder, as shown in FIG. 1 attached hereto. The collection grid was constructed of ½" thick grating on top of a solid plate, which was placed in the bottom of the cylinder as a collector floor, as shown in FIG. 3 attached hereto. The plate was drilled with 253 holes through the cells of the grating, each having a ¼" diameter. Each one of the holes was centered in the collection grid with 0.65" centers, which created collection squares or cells, as shown in FIG. 3 attached hereto. The collection grid was secured to the floor using a silicon sealer.

12. Clear plastic tubes were pressed into each hole from below until the tubes extended approximately 1/16" above the top of the plate. A watertight seal was formed around each of the tubes. A clear plastic baffle was drilled to match the holes in the collector floor and installed ½" above the end of the 8" plastic tubes, as shown in FIG. 2 attached hereto. Both the collector and the lower portion of the plastic tubes were marked to accurately identify each individual tube during experimenting.

13. A single flow-regulated water inlet was installed so that the inlet could be accurately centered and placed six inches above the top of the bed to be tested. A six inch headspace is commonly used in trickle bed reactors into which the present invention is commonly installed. The water flow rate used in the experiments was one liter per minute.

14. The flow device and the steel cylinder/collector assembly were mounted on a seven foot tall stand. The fluid flow collection was at eye-level, where it could be easily observed.

15. A 1,000 mL graduated cylinder was used to collect and measure the flow through a single tube. A tight fitting funnel was placed over the cylinder to ensure that no water would enter other than through the single plastic tube. The funnel was slip-fitted over each collector tube one at a time. A digital timer was used for timing.

16. Several measurements were taken during the experiments to help determine the amount of lateral fluid distribution that was achieved using several different ceramic units. Table I summarizes the results of each experiment. The prior art ceramic unit results are shaded in gray in Table I and the results for the ceramic units made in accordance with the present invention are non-shaded and located on the right side of Table I.

17. The first measurement that was used to compare the lateral fluid distribution caused by the ceramic units was a determination of the number of cells that had liquid flow present within the collection grid. The larger the number of cells with flow, or active cells, indicates better lateral distribution because the feed stream is distributed across a larger area containing cells. The lower the flow rate within each cell also indicates better lateral distribution due to the dividing of the feed stream by the cells that distributes the feed stream better laterally. The results of this experiment are shown in Table I in the row labeled as "1. Total Number of Active Cells" and "2. % of Active Cells." The percentage of active cells is calculated by dividing the number of active cells by the total number of cells, 253. The best performing prior art ceramic unit was Product E. The best performing ceramic unit made in accordance with the present invention was Product F. Product F had 11% more active cells than the best performing prior art ceramic unit in this experiment, which represents a 46% improvement over the prior art.

18. The next experiment that was conducted determined an active area of the grid in which flow was determined and is labeled as the row "3. Area of Active Cells". The larger the Area of Active Cells, the better. The larger Area of Active Cells indicates better lateral distribution than a smaller Area of Active Cells. The Area of Active Cells was calculated by multiplying the horizontal distance of the active cells by the vertical distance of the active cells. Not every cell within the Area of Active Cells has flow. The ceramic unit made in accordance with the present invention labeled in Table I as Product F performed the best with the greatest Area of Active Cells being 180. The prior art ceramic unit labeled as Product C in

Table I performed the best with 143 active cells. It is believed that Product C would perform better than the Fulton Ceramic Unit because Product C has more openings than the Fulton Ceramic Unit. Product F made in accordance with the present invention performed approximately 26% better than the prior art Product C in this experiment.

19. Measurements were taken to determine the distance the flow was laterally distributed based upon the feed location. Product H, which is made in accordance with the present invention, performed the best compared to any of the tested ceramic units, with a total of ten cells with flow located greater than five cells away from the central feed location and three cells with flow located greater than six cells away from the central feed location. Out of the prior art ceramic units that were tested, the best performance was obtained by using Product C. Product C only had two cells with flow located greater than five cells away from the central feed location. No cells greater than six cells away from the central feed location had any flow in them in the prior art ceramic units. Product H performed at least five times better than Product C when determining the number of active cells greater than five cells away from the feed stream location. Product H performed at least three times better than Product C when determining the number of active cells greater than six cells away from the feed stream location.

20. Measurements were also taken of the flow rates within each cell. A lower flow rate is indicative of better lateral distribution, since the flow is distributed across a larger number of cells. The present invention embodiments with one central opening and surrounding elliptical openings consistently outperformed the prior art units tested.

21. The average flow rate per active cell was determined for each active cell. To determine this average flow rate, the total inlet feed flow rate was divided by the number of active cells. The lower the average flow rate, the better. A lower average flow rate per active cell indicates that the feed stream was distributed among a greater number of active cells. Product F performed the best with only 1.16% average of the flow rate. With respect to the prior art ceramic units, Product E performed the best with 1.69% average of the flow rate. The prior art with the closest structural similarity to the Fulton Ceramic Unit, Product C, had a 1.72% average of the flow rate. The present invention performed approximately 30% better than the best performing prior art ceramic units tested.

22. The maximum flow rate in a cell was also measured for all of the tested ceramic units. The maximum flow in a cell was determined by measuring the flow rates of each active cell and determining the highest flow rate of those cells. In this experiment, the lower the maximum flow rate, the better. The best performing ceramic unit tested was Product F with only a 4.46% maximum flow rate in any one cell. The best performing prior art ceramic unit was Product C with an 8.45% maximum flow rate in any one cell. The best embodiment of the present invention, Product F, performed approximately 47% better than the best performing prior art ceramic unit tested, Product C.

23. Measurements for the percentage of active cells with greater than 3% of total flow and greater than 5% of total flow were also taken. The percentage of active cells with greater than three and five percent of the total flow was determined by comparing the flow rates of the active cells with three and five percent of the total flow rate of the inlet feed stream respectively. With respect to the experiment measuring greater than 3% of total flow, the best performer in accordance with the present invention was Product H with only 8.33% of the cells having a flow rate greater than 3% of the total flow rate. The best performing prior art was Product C with 17.24% of the cells having a flow rate greater than 3% of the total flow rate. In this experiment, the lower the percentage of active cells with greater than 3% of total flow, the better. The present invention, Product H, performed approximately 52% better than the prior art ceramic units, Product C, in this experiment. With respect to the experiment measuring greater than 5% of total flow, the best performer in accordance with the present invention was Product H with 0% of the cells having a flow rate greater than 5% of the total flow rate. The best performing prior art was the Product E with 5.08% of the cells having a flow rate greater than 5% of the total flow rate. In this experiment, the lower the percentage of active cells with greater than 5% of total flow, the better. The present invention, Product C, performed significantly better than the prior art ceramic units, Product E, in this experiment also.

24. To the best of my knowledge and understanding, based upon experiments that I performed, lateral fluid distribution was improved in all performance indicators measured when using the ceramic units of the present invention compared with use of prior art ceramic units.

Product F performed the best consistently when compared with the consistently best performing prior art ceramic filter unit, Product C.

25. The attached Table I demonstrates the amount of lateral fluid distribution that was obtained by using the ceramics of the present invention and prior art ceramic units. As can be seen from the Table I, advantageous properties are associated with the use of the central opening with elliptical openings. The advantageous properties resulting from the use of elliptical openings are unexpected.

26. Crystaphase has enjoyed much commercial success from the sale of these ceramic units. Crystaphase began selling the ceramic units made in accordance with the present invention in 1998. Since then, Crystaphase has sold more than eight million dollars worth of units made in accordance with the present invention, which approximates 40,000 cubic feet of product being sold, which correlates to about 30% – 35% of the total market over the past six years. With so many units sold, the ceramic units should be deemed to have met an unfilled need in the industries in which these ceramic units have been sold.

27. I believe there is no motivation for one of ordinary skill in the field of ceramic filter units to utilize ceramic disc units containing a central circular opening and at least three elliptical openings in accordance with the present invention, at least without resorting to hindsight after viewing the present invention.

28. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Sec. 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the publication or any patent issued thereon.

11/5/03
Date

John N. Glover

TABLE I - SUMMARY OF COLD FLOW EXPERIMENT RESULTS

Shape	PRIOR ART					PRESENT INVENTION		
	Spheres		Cylindrical Openings			Elliptical Openings		
Product	A (3/4" Ceramic balls)	B (3/4" Ceramic balls)	C (5/8" TK-10)	D (7/8" TK-10)	E (5/8" Dypor 607)	F (5/8" BG-1000)	G (7/8" BG-1000)	H (7/8" BG-1002)
Top layer – Depth	6"	12"	6"	6"	6"	6"	6"	6"
Shape	Sphere	Sphere	Disc with 7 cylindrical openings	Disc with 7 cylindrical openings	Disc with one cylindrical opening and six flutes	Disc with four elliptical and one central circular openings	Disc with four elliptical and one central cylindrical openings	Elongated Disc with four elliptical and one central cylindrical openings
Void space	n/a	n/a	55%	55%	60%	60%	60%	63%
Bottom layer – Depth	6"	-	6"	6"	6"	6"	6"	6"
Size and Shape	¾" Sphere	-	¾" Sphere	¾" Sphere	¾" Sphere	¾" Sphere	¾" Sphere	¾" Sphere
Void space	~39 %	-	~39 %	~39 %	~39 %	~39 %	~39 %	~39 %
1. Total number of active cells	36	46	58	46	59	86	69	84
2. % of active cells	14.23%	18.18%	22.92%	18.18%	23.32%	33.99%	27.27%	33.20%
3. Area of Active Cells	49	100	143	72	120	180	121	153
4. Number of active cells greater than 5 cells distance from center	0	0	2	0	1	4	2	10
5. Number of active cells greater than 6 cells distance from center	0	0	0	0	0	0	0	3
6. Average Flow Rate per Active Cell	2.78%	2.17%	1.72%	2.17%	1.69%	1.16%	1.45%	1.19%
7. Maximum Flow Rate in a Cell	10.42%	7.03%	8.45%	10.39%	9.07%	4.46%	7.17%	9.74%
8. Percentage of active cells greater than 3% of total flow	27.78%	23.91%	17.24%	26.09%	23.73%	10.47%	8.70%	8.33%
9. Percentage of active cells greater than 5% of total flow	25.00%	8.70%	5.17%	6.52%	5.08%	0.00%	7.25%	3.57%

CERTIFICATE OF MAILING

I hereby certify that this paper is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date of Deposit: 05-30-06 By: Terri Lindquist

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Appellant: GLOVER, JOHN N.	§	Art Unit: 1723
Filed: May 27, 1999	§	Primary Examiner: David L. Sorkin
Application No.: 09/320,950	§	Docket No.: 20781.004
For: FILTERING MEDIUM AND METHOD FOR CONTACTING SOLIDS CONTAINING FEEDS FOR CHEMICAL REACTORS	§	

AMENDED APPEAL BRIEF
(under 37 C.F.R. § 41.37)

This is an appeal from the final rejection of Claims 59, 61 – 67, and 69 – 85 in the above referenced patent application. The Final Office Action was dated June 7, 2005. A Notice of Panel Decision from Pre-Appeal Brief Review was mailed to Appellant on January 12, 2006, setting forth that the application remains under appeal because there is at least one actual issue for appeal.

Applicant's original Appeal Brief was filed on March 13, 2006. A Notification of Non-Compliant Appeal Brief was mailed on March 29, 2006, and this Amended Appeal Brief is being filed on May 26, 2006, in response thereto, along with the appropriate extension of time fees.

I. REAL PARTIES IN INTEREST

The inventor, John N. Glover, and the assignee, Crystaphase International, Inc., are the only real parties in interest with respect to the captioned patent application.

II. RELATED APPEALS AND INTERFERENCES

There are none.

III. STATUS OF CLAIMS

A. Status of the Claims

1. Claims cancelled: 1-58, 60 and 68.
2. Claims withdrawn (but not cancelled): None.
3. Claims pending: 59, 61-67 and 69-85.
4. Claims allowed: None.
5. Claims rejected: 59, 61-67 and 69-85.

B. Claims on Appeal

Claims 59, 61-67 and 69-85 are presently on appeal.

IV. STATUS OF AMENDMENTS

Claims 59, 61-67 and 69-85 were finally rejected in an Office Action dated June 07, 2005. Claims 59, 61-67 and 69-81 were rejected under 35 U.S.C. §103(a) for obviousness over Kramer (US 4,615,796) (hereinafter "Kramer") in view of "CE Refresher: Catalyst Engineering, Part 2" by John Fulton (hereinafter "Fulton"). Claims 82-85 were rejected under 35 U.S.C. §112 for failing to comply with the written description requirement.

Appellant filed an Amendment and Response Subsequent to Final Rejection on August 8, 2005. An Advisory Action was mailed to Appellant on August 29, 2005, advising Appellant that the Amendment and Response did not place the application in condition for allowance.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Claims 59, 67 and 78 are independent claims. Claims 61-66, 79 and 82-83 are ultimately dependent upon Claim 59. Claims 69-77, 80 and 84-85 are ultimately dependent upon Claim 67. Claim 81 is dependent upon Claim 78. A summary of the subject matter of the most relevant independent and dependent claims currently on appeal is presented as follows:

Claim 59

The first independent claim, Claim 59, features a method of fluid distribution in a chemical reactor 22 comprising the steps of:

(A.) providing a layer 66, 68, 70 (FIG. 2) of a plurality of ceramic filter units 15 (FIGS. 4-16), at least some of the ceramic filter units 15 including a body having a substantially annular outer peripheral shape (FIGS 4-5), a central opening 108 extending through the body, and at least three elliptical openings 89 extending through the body and positioned between the central opening 108 and an outer periphery of the body so that a combination of the central opening 108 and the at least three elliptical openings 89 define a plurality of fluid flow passageways 87, 88, 89, 108 (FIGS. 4, 5, 14) extending through the at least some of the plurality of ceramic filter units 15;

(B.) contacting an organic-based feed stream 51 (FIG. 2) with the layer 66, 68, 70 of the plurality of ceramic filter units 15; and

(C.) subdividing the organic-based feed stream 51 into a plurality of smaller fluid streams by passing the organic-based feed stream 51 through the plurality of fluid flow passageways 87, 88, 89, 108 (FIGS. 4, 5, 14) prior to the organic-based feed stream 51 contacting a catalyst bed in the chemical reactor 22.

Claim 67

The second independent claim, Claim 67, features a method of fluid distribution in a chemical reactor 22 comprising the steps of:

(A.) providing a layer 66, 68, 70 (FIG. 2) of a plurality of ceramic filter units 15 (FIGS. 4-16), at least some of the ceramic filter units 15 including a body having a substantially polygonal outer peripheral shape (FIGS 4-5), a central opening 108 extending through the body, and at least three elliptical openings 89 extending through the body and positioned between the central opening 108 and an outer periphery of the body so that a combination of the central opening 108 and the at least three elliptical openings 89 define a plurality of fluid flow passageways 87, 88, 89, 108 (FIGS. 4, 5, 14) extending through the at least some of the plurality of ceramic filter units 15;

(B.) contacting an organic-based feed stream 51 (FIG. 2) with the layer 66, 68, 70 of the plurality of ceramic filter units 15; and

(C.) subdividing the organic-based feed stream 51 into a plurality of smaller fluid streams by passing the organic-based feed stream 51 through at least some of the plurality of fluid flow passageways 87, 88, 89, 108 (FIGS. 4, 5, 14) prior to the organic-based feed stream 51 contacting a catalyst bed in the chemical reactor 22.

Claim 78

The third independent claim, claim 78, features a method of fluid distribution in a chemical reactor comprising the steps of:

(A.) providing a layer 66, 68, 70 (FIG. 2) of a plurality of ceramic filter units 15 (FIGS. 4-16), at least some of the ceramic filter units 15 including a body, a central opening 108 extending through the body, and at least three elliptical openings 89 also extending through the body and positioned between the central opening 108 and an outer periphery of the body so that a combination of the central opening 108 and the at least three elliptical openings 89 define a plurality of fluid flow passageways 87, 88, 89, 108 (FIGS. 4, 5, 14) extending through each of the plurality of ceramic filter units 15;

(B.) contacting an organic-based feed stream 51 (FIG. 2) with the layer 66, 68, 70 of the plurality of ceramic filter units 15; and

(C.) subdividing the organic-based feed stream 51 into a plurality of smaller fluid streams by passing the organic-based feed stream 51 through the at least some of the plurality of fluid flow passageways 87, 88, 89, 108 prior to the organic-based feed stream 51 contacting a catalyst bed in the chemical reactor 22.

Claim 82

Dependent claim 82 features the method of claim 64, wherein the fluted outer peripheral surface of the at least one of the plurality of ceramic filter units has sharp edges.

Claim 83

Dependent claim 83 features the method of claim 65, wherein at least one of the recessed notches of the outer periphery has sharp edges.

Claim 84

Dependent claim 84 features the method of claim 70, wherein at least one of the notches recessed from the outer periphery has sharp edges.

Claim 85

Dependent claim 85 features the method of claim 76, wherein at least one of the recessed notches on the outer periphery has sharp edges.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether Claims 59, 61-67 and 69-81 are unpatentable under 35 U.S.C. §103(a) for obviousness over Kramer in view of Fulton.

2. Whether Claims 82-85 are unpatentable under 35 U.S.C. §112 for failing to comply with the written description requirement.

VII. ARGUMENT

1. Rejection Under 35 U.S.C. § 103(a) Over Kramer In View Of Fulton is Improper.

Independent Claims 59, 67, and 78, and the claims dependent therefrom, are not obvious over Kramer in view of Fulton. To establish a prima facie case of obviousness, three criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Second, there must be a reasonable expectation of success. Finally, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based upon Appellant's disclosure. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991).

Appellant respectfully submits that none of the three above-described criteria have been met in the present case, and in support provides the following remarks.

The References Do Not Teach or Suggest All Claim Limitations

Kramer in combination with Fulton does not teach or suggest all of the claim limitations of Claims 59, 67 and 78, which is a requirement to establish a *prima facie* case of obviousness.

Claims 59, 67 and 78 each relate to a method of fluid distribution. Appellant respectfully submits that neither Fulton nor Kramer discloses or suggests the element of fluid distribution. Kramer discloses a method of filtering. Fluid distribution is not the same as, nor equivalent to, or inherent in, filtering. Fluid distribution involves resubdividing, a plurality of times, an incoming fluid stream into multiple smaller fluid streams so that the incoming stream is

distributed, i.e., spread across, the fluid entry cross section of a reactor bed in a uniform manner. (see Appellant's Application, ¶ [0055]). This uniform fluid distribution occurs in addition to, and not because of, any filtration that may also be occurring.

Kramer does not teach or suggest that its guard bed particles have any fluid distribution properties. Kramer only teaches that the particles can be used for traditional filtration purposes, i.e., removing suspended solids of greater than 10 microns in diameter, preferably iron sulfide, from mixed phase gas-liquid-solid streams (see Kramer, col. 3, lines 8 – 15). Kramer is tailored to correcting a specific problem in the petroleum processing industry, namely filtration-based removal of solid materials. This filtration process would not necessarily result in fluid distribution, and in particular would not produce uniform fluid distribution across the cross section of the bed as achieved by the present invention. Solids filtration is clearly distinguishable from, and does not make obvious, gas and liquid fluid distribution as claimed in the present invention.

Claims 59, 67, and 78 each also describe and claim the feature of subdividing an organic-based feed stream into a plurality of smaller fluid streams by passing the organic-based feed stream through one or more of a plurality of fluid flow passageways. An embodiment of Appellant's invention involves the use of ceramic filter units with openings, wherein the particular fluid in the reactor not only passes around the ceramic filter units, but also <u>through</u> at least some of the units via the plurality of fluid flow passageways created by the openings in the units. In particular, the passageways comprise three or more passages surrounding a central passage.

Appellant respectfully submits that this feature is not disclosed or suggested in Kramer or Fulton. Kramer sets forth that alternative shaped guard bed particles can be used. (see Kramer, col. 4, lines 1 – 4). However, every example in Kramer utilizes a sphere or a cylinder, with the sphere being the particle shape of choice. There is no teaching or suggestion that ceramic filter units with openings, and specifically with three or more passages surrounding a central passage, could be utilized, or that such a configuration would be beneficial. Without this specific arrangements of openings claimed in the present invention, the particles disclosed in Kramer would not provide the subdivided flow required to uniformly distribute the organic-based feed stream across a catalyst bed to prevent channeling and other deleterious consequences.

Claims 59, 67, and 78 each also describe and claim the use of elliptical openings. Appellant respectfully submits that neither Kramer nor Fulton teaches the use of elliptical openings, or recognizes the advantages that this shape of opening provides. The Primary Examiner contends that Fulton teaches circular openings, and that the "broadest reasonable definition of an ellipse includes a circle" (Final Office Action, p. 3, lines 8-9); however, Appellant is not claiming "circular openings," but only "elliptical" openings. Furthermore, Appellant's elliptical shaped openings provide improved fluid distribution properties when compared to circular openings (see No Reasonable Expectation of Success section below), which indicates that elliptical openings and circular openings are indeed distinguishable from each other, both in shape and results achieved. Also, the spaces around and between the particles in Kramer would eventually become plugged with solids, while the elliptical openings in the ceramic units of the present invention would continue to allow fluid flow through the ceramic units, which results in uniform fluid distribution throughout the packed bed.

No Reasonable Expectation of Success

There must be a reasonable expectation of success in order for the prior art to be modified or combined to reject claims as *prima facie* obvious. *See In re Merck & Co., Inc.*, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Neither Kramer nor Fulton indicates or suggests that Appellant's claimed invention would have a reasonable expectation of success.

To the contrary, Appellant's use of ceramic units with elliptical openings unexpectedly results in advantageous results when compared to prior art materials. To support this assertion, Appellant submitted a declaration from the inventor John N. Glover in the Amendment and Response to Office Action filed November 5, 2003. (See Section IX – Evidence Appendix). This declaration sets forth the following pertinent information:

(a) Appellant performed experiments comparing the ceramic filter units of the present invention with prior art ceramic filter units that are structurally similar to guard bed particles/catalyst pellets such as those found in Fulton and Kramer.

(b) Appellant's use of the ceramic units of the present invention unexpectedly resulted in advantageous fluid distribution properties, such as improved horizontal fluid distribution and significantly decreased pressure drop across a filter bed.

(c) The use of elliptical openings advantageously provided additional flow control parameters, i.e., the ability to vary the major and minor axes of the elliptical openings, when designing the ceramic units.

(d) The Assignee of Appellant has enjoyed substantial commercial success from the sale of the ceramic units of the present invention, which should be considered indicative of the fact that the ceramic units have met a long felt, unfilled need in the relevant industry.

No Suggestion or Motivation to Combine References

Finally, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings, *assuming arguendo* that the references contain the specific teachings of Appellant's claim limitations directed to fluid distribution and elliptical openings.

"[The] teachings of references can be combined *only* if there is some suggestion or incentive to do so." *See In re Fritch* 23 U.S.P.Q. 2d 1780, 1783 (Fed. Cir. 1992) (emphasis in the original). "The mere fact that the prior art may be modified in the manner suggested by the Primary Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *See id* at 1783-84. Further, a person of ordinary skill in the art must have some motivation to combine the reference teachings *in the particular manner claimed. See, e.g., In re Kotzab*, 55 U.S.P.Q 2d 1313, 1317 (Fed. Cir. 2000) (stating that "[p]articular findings must be made as to the reason the skilled artisan, with *no knowledge* of the claimed invention, would have selected these components for combination in the manner claimed." (emphasis added).

Appellant respectfully submits that one of ordinary skill in the art would not be motivated to combine the teachings of Kramer and Fulton to create Appellant's claimed invention. The Primary Examiner has attempted to piece together Appellant's claimed invention from Kramer and Fulton using a hindsight reconstruction of the prior art, which is impermissible.

For example, Appellant claims a method of flow distribution. The Primary Examiner does not specifically identify the motivation for one skilled in the art to modify the filtration units in Kramer to provide openings that achieve enhanced flow distribution. Flow distribution is an entirely different function from filtration. In fact, one skilled in the art would not seek to add a plurality of openings to the guard bed particles taught by Kramer, because this would diminish the effectiveness of these particles in filtering solid materials. That is, adding openings to the particles would allow more solids to pass through the particles, which is contrary to the intended purpose of the invention.

Further, Appellant claims a central opening in the cylindrical unit, and a plurality of other openings surrounding the central opening. The Primary Examiner does not specifically identify the motivation in either reference for one skilled in the art to combine the references to produce these features. Kramer does not teach these features at all, and merely sets forth the open-ended statement that the "particles can be in other configurations." (Kramer, col. 4, lines 1 – 4). Fulton teaches a unit with openings therein, but only as an example of "the almost limitless varieties possible." (Fulton, p. 97). These types of broad, generalized statements in the references are insufficient to provide specific motivation to one skilled in the art to combine the references. Only improper hindsight reconstruction would lead one to believe otherwise.

Even further, the Appellant claims elliptical-shaped openings. The Primary Examiner does not specifically identify the motivation for one skilled in the art to take the step of making the plurality of surrounding openings elliptical in shape. In fact, the words "ellipse" or "elliptical" are never used, or even suggested, in either reference.

The Primary Examiner has not set forth the *prima facie* elements necessary to show why one with ordinary skill in the art would be motivated to combine the Kramer and Fulton references to provide the missing elements of the current invention.

2. Rejection under 35 U.S.C. §112 is Improper.

The Examiner has rejected claims 82-85 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. More specifically, the Examiner considers the language in these claims relating to the outer periphery of the filter unit having "sharp edges" to be new matter. A common feature of the polygonal shaped units and units with fluted surfaces or recessed notches of Appellant's invention is that they each have sharp edges and/or corners on the outer peripheries of the unit surface.

The Examiner indicates that there is "no discussion of the issue of edge sharpness" in the originally filed disclosure. (Final Office Action, p. 2, section 2); Appellant respectfully submits, however, that §112 does not require that the disclosure include a "discussion" of the claimed subject matter. For example, under proper circumstances, the drawings alone may provide a written description of an invention under §112. *See Cooper Cameron v. Kvaerner Oilfield*, 291 F. 3d 1317 (Fed. Cir. 2002). Drawings constitute an adequate description if they describe what is claimed and convey to those of skill in the art that the patentee actually invented what is claimed. *Id.*

FIGS. 5, 6, 7, 8, 9, 10, 11 and 13 of the drawings in Appellant's originally filed disclosure all show embodiments of the filter unit having three or more sides. The sides of each unit connect such that sharp edges and/or corners are formed on the outer periphery of the unit. In

connection therewith, paragraph [0012] of Appellant's published application teaches that the units may have "substantially any polygonal configuration, such as triangles, quadrilaterals and pentagons." Thus, to put it another way, the triangular, quadrilateral, pentagonal, and other similarly shaped figures shown in the aforementioned drawings all, by definition, have three or more sharp corners and/or edges formed on their outer peripheries. The sharp edges and/or corners on the units in the drawings are particularly distinguishable when compared with the units shown in FIGS. 4 and 12 on the same page, which have curved exterior peripheries and no sharp corners/edges. This distinguishing feature is prominently displayed in the drawings, and would be understood by one skilled in the art based solely upon viewing the drawings.

Argument Summary

As to the obviousness rejection made under 35 U.S.C. §103, neither the references alone, or in combination, teach or suggest each and every element of independent claims 59, 67, or 78, or the claims dependent therefrom, which is required to establish a *prima facie* case of obviousness. There is no reasonable expectation of success in combining the references to produce Appellant's claimed invention, which is another requirement to establish a *prima facie* case of obviousness. Lastly, there is no suggestion or motivation to combine reference teachings, *assuming arguendo*, that the references even teach Appellant's claim limitations, as also required to establish a *prima facie* case of obviousness.

As to the written description rejection made under 35 U.S.C. §112, Appellant respectfully submits that the features in claims 82 - 85 are described in the drawings, and are not new matter.

Appellant's drawings describe what is claimed and convey to those skilled in the art that Appellant actually invented what is claimed.

Conclusion

For the foregoing reasons, it is submitted that the Primary Examiner's rejections of claims 59, 61-67 and 69-85 are erroneous, and reversal of the Primary Examiner's decision is respectfully requested.

The required fee for submitting a brief in support of appeal was originally submitted on March 13, 2006. A check for $60.00 for a one month extension of time in connection with this responsive brief to the Notification of Non-Compliant Appeal Brief is submitted herewith.

Please charge any additional required fees and credit any overpayments, to the Deposit Account of Bracewell & Giuliani LLP, Deposit Account No. 50-0259 (attorney docket no. 020781.04).

Respectfully submitted,

Date: 5/30/06

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VIII. CLAIMS APPENDIX

A copy of the claims presented in this appeal is included below.

Claim 59. A method of fluid distribution in a chemical reactor comprising the steps of:

providing a layer of a plurality of ceramic filter units, at least some of the ceramic filter units including a body having a substantially annular outer peripheral shape, a central opening extending through the body, and at least three elliptical openings extending through the body and positioned between the central opening and an outer periphery of the body so that a combination of the central opening and the at least three elliptical openings define a plurality of fluid flow passageways extending through the at least some of the plurality of ceramic filter units;

contacting an organic-based feed stream with the layer of the plurality of ceramic filter units; and

subdividing the organic-based feed stream into a plurality of smaller fluid streams by passing the organic-based feed stream through the plurality of fluid flow passageways prior to the organic-based feed stream contacting a catalyst bed in the chemical reactor.

Claim 61. A method as defined in claim 59, further including the steps of: removing contaminants from a contaminated organic-based feed stream; and providing a decontaminated and uniformly spread organic-based feed stream to a catalyst bed for further processing in the chemical reactor.

Claim 62. A method as defined in claim 59, including the step of packing the ceramic filter units into the chemical reactor with a packing factor of about 200 to 500 ft2/ft3.

Claim 63. A method as defined in claim 59, including the step of packing the ceramic filter units in graduated layers into the chemical reactor with each layer having a different packing factor of about 200 to 500 ft2/ft3.

Claim 64. A method as defined in claim 59, wherein the body of at least one of the plurality of ceramic filter units has a fluted outer peripheral surface.

Claim 65. A method as defined in claim 59, wherein the outer peripheral includes a plurality of recessed notches extending inwardly from the outer periphery towards the medial portion of the ceramic filter unit.

Claim 66. A method as defined in claim 59, wherein the at least three elliptical openings substantially surround the central opening between the central opening and the outer periphery to thereby define a ring around the central opening.

Claim 67. A method of fluid distribution in a chemical reactor comprising the steps of:

providing a layer of a plurality of ceramic filter units, at least some of the ceramic filter units including a body having a substantially polygonal outer peripheral shape, a central opening extending through the body, and at least three elliptical openings extending through the body and positioned between the central opening and an outer periphery of the body so that a combination of the central opening and the at least three elliptical openings define a plurality of fluid flow passageways extending through the at least some of the plurality of ceramic filter units;

contacting an organic-based feed stream with the layer of the plurality of ceramic filter units; and

subdividing the organic-based feed stream into a plurality of smaller fluid streams by passing the organic-based feed stream through at least some of the plurality of fluid flow passageways prior to the organic-based feed stream contacting a catalyst bed in the chemical reactor.

Claim 69. A method as defined in claim 67, further including the steps of: removing contaminants from a contaminated organic-based feed stream; and providing a decontaminated and uniformly spread organic-based feed stream to a catalyst bed for further processing in the chemical reactor.

Claim 70. A method as defined in claim 67, wherein the outer peripheral includes a plurality of notches recessed from the outer peripheral towards the medial portion of the ceramic filter unit.

Claim 71. A method as defined in claim 67, including a step of utilizing ceramic filter units wherein the outer periphery has a polygonal shape with a length of about 1/8 inches to about 3 inches.

Claim 72. A method as defined in claim 67, wherein the body of at least one of the plurality of ceramic filter units has a substantially polygonal shape selected from the group consisting of triangles, quadrilaterals, squares, rectangles, pentagons, hexagons, heptagons, and octagons.

Claim 73. A method as defined in claim 67, wherein the body of at least one of the plurality of ceramic filter units has a square shape with a width of about ¼ inches to about 3 inches.

Claim 74. A method as defined in claim 67, wherein the body of at least one of the plurality of ceramic filter units has a rectangular shape with a length of about ¼ inches to about 3 inches and a width of about ¼ inches to about 3 inches.

Claim 75. A method as defined in claim 67, wherein the body of at least one of the plurality of ceramic filter units has a closed-planed shape with a width of about ¼ inches to about 3 inches.

Claim 76. A method as defined in claim 67, wherein the outer peripheral includes a plurality of recessed notches extending inwardly from the outer periphery towards the medial portion of the ceramic filter unit.

Claim 77. A method as defined in claim 67, wherein the at least three elliptical openings substantially surround the central opening between the central opening and the outer periphery to thereby define a ring around the central opening.

Claim 78. A method of fluid distribution in a chemical reactor comprising the steps of:

providing a layer of a plurality of ceramic filter units, at least some of the ceramic filter units including a body, a central opening extending through the body, and at least three elliptical openings also extending through the body and positioned between the central opening and an outer periphery of the body so that a combination of the central opening and the at least three elliptical openings define a plurality of fluid flow passageways extending through each of the plurality of ceramic filter units;

contacting an organic-based feed stream with the layer of the plurality of ceramic filter units; and subdividing the organic-based feed stream into a plurality of smaller fluid streams by passing the organic-based feed stream through the at least some of the plurality of fluid flow passageways prior to the organic-based feed stream contacting a catalyst bed in the chemical reactor.

Claim 79. A method as defined in Claim 59, wherein the central opening is circular.

Claim 80. A method as defined in Claim 67, wherein the central opening is circular.

Claim 81. A method as defined in Claim 78, wherein the central opening is circular.

Claim 82. A method as defined in Claim 64, wherein the fluted outer peripheral surface of the at least one of the plurality of ceramic filter units has sharp edges.

Claim 83. A method as defined in Claim 65, wherein at least one of the recessed notches of the outer periphery has sharp edges.

Claim 84. A method as defined in Claim 70, wherein at least one of the notches recessed from the outer periphery has sharp edges.

Claim 85. A method as defined in Claim 76, wherein at least one of the recessed notches on the outer periphery has sharp edges.

IX. EVIDENCE APPENDIX

This Appendix includes a copy of a declaration submitted by inventor John N. Glover in the Amendment and Response to Office Action filed November 5, 2003.

X. RELATED PROCEEDINGS APPENDIX

None.